

REMARKS

Applicant appreciates the thorough examination of the present application as reflected by the Office Action. Applicant submits that the present application is in form for allowance for the reasons discussed below.

The Drawing Objections:

The drawings are objected to as they allegedly fail to show a "balanced feed." Office Action, p. 2. The drawings are also objected to based on an alleged double reference using characters "135R, 137R" and 710, 715, 720 and 725. Office Action, p. 3. Applicant respectfully submits that both these objections are unfounded. As stated in the specification in describing Figures 7A-7C:

Figures 7A-7C illustrate that the audio driver circuit **127** of the electronic circuit **120** can be coupled to the flat-panel speaker **130** through a balanced feed. As is known to those of skill in the art, the term "balanced feed" refers to transmitting a differential signal over leads having positive and negative voltages, rather than leads representing signal and ground voltages, in order to reduce the susceptibility to noise either internally generated by the wireless terminal or external noise.

As shown in **Figure 7A**, the leads **135, 137** of the flat-panel speaker **130** may have a direct connection to the audio driver circuit **127**. Alternatively, an RF isolation circuit **135R, 137R**, comprising either an inductor **710, 715**, one on each lead **135, 137**, or a tank circuit **720, 725** on respective leads **135** and **137**, may be used to couple the audio driver circuit **127** and the flat-panel speaker **130**, as shown in **Figures 7B** and **7C**. Other RF isolation circuit configurations may also be used as is known to those of skill in the art.
See specification at p. 9, lines 21-33.

Thus, three variants on a balanced feed are shown in Figures 7A through 7C, respectively. The fact that the signals on leads 135 and 137 are used to transmit "a differential signal over leads having positive and negative voltages, rather than leads representing signal and ground voltages" need not be illustrated with such descriptive specificity in the drawing, that is the purpose of the corresponding description in the text. The balanced feed is clearly identified and shown in the drawings as the leads 135, 137 with a differential signal having positive and negative voltages being provided thereon by the audio driver circuit 127.

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Furthermore, with respect to the objection to the usage of 135R and 137R, these numbers refer to an "RF isolation circuit," different possible configurations of which are shown in Figures 7A and 7B, respectively. In contrast, the "inductor 710, 715" as contrasted with the "tank circuit 720, 725" are differently numbered as they reference particular configurations of an RF isolation circuit.

Accordingly, Applicant requests withdrawal of the objections to the drawings. Should the Examiner continue to maintain the objections, Applicant respectfully requests some suggestion of an acceptable change from the Examiner as Applicant fails to understand the basis for the Examiner's objections.

Claims 23-26 Are in Form for Allowance:

The Office Action states that the previously indicated allowability of, among other claims, Claims 23-26, is withdrawn in view of "Ying." Office Action, p. 2. However, none of these claims are rejected over Ying in the Office Action. Accordingly, these claims are in form for allowance.

The Prior Art Rejections:

Claims 15 and 27-33 stand rejected under 35 U.S.C. § 102(e) as anticipated by United States Patent Application Publication No. 2005/0024271 to Ying *et al.* ("Ying"). Claims 1-14 and 16-20 stand rejected under 35 U.S.C. § 102(e) as anticipated or, in the alternative, under 35 U.S.C. § 103 as obvious, over Ying. Applicant submits that the claims are patentable at least for the reasons discussed below.

Independent Claim 1 is Patentable Over Ying:

The rejection of independent Claim 1 cites to the speaker 23 of Ying as disclosing a "flat-panel speaker." Office Action, p. 6. However, speaker 23 is merely illustrated as a rectangle. There is no indication the speaker 23 is anything other than a conventional micro-speaker commonly found in cellular telephones. Furthermore, Applicant was unable to find any discussion of a flat-panel speaker anywhere in Ying. In fact, the only references to item

23 in Ying are as follows:

[0027] Embodiments of the present invention will now be described in detail below with reference to the figures. FIG. 1 illustrates a wireless device 10 that includes an acoustic channel 15 with an integrated antenna 20 and a speaker 23 in communication with the channel 15. The speaker 23 may be disposed in the channel 15, but is typically larger than the channel 15 and can be configured to reside below or outside the channel 15 but configured to be in acoustic communication with the channel 15. As shown, the device 10 can also include an antenna cavity 21 that can be configured to substantially encase or enclose the underlying acoustic channel 15 therein (and may, in certain embodiments, also encase a second antenna as will be discussed further below). The device 10 may also include a printed circuit board 30, a battery 35, a keypad 38, and a display 40. The device 10 can include opposing first and second primary surfaces, which may descriptively be termed forward 10f and rear 10r surfaces or portions, respectively. The printed circuit board 10 can include an acoustic channel aperture 30a (see FIG. 2) that receives a portion of the acoustic channel 15 therein and/or therethrough. The channel 15 may also terminate so that it is substantially flush with the rear side of the printed circuit board (not shown) proximate the aperture 30a (not shown). In operation, the acoustic channel 15 guides or routes the acoustic output from the speaker 23 to a desired location (shown as the upper forward side of the device above the display 38).

[0028] As shown in FIG. 1, the acoustic channel 15 can be configured to reside proximate the rear portion of the printed circuit board 30 with the channel 15 extending vertically a distance proximate the speaker 23 and then turning about a forwardmost upper edge portion to cause the channel 15 to approach and/or enter the aperture 30a in a substantially horizontal orientation when the device 10 is held as shown in FIG. 1. The forwardmost portion of the channel 15 may reside above the display 38. The speaker 23 and/or channel 15 may be oriented in different configurations to guide the acoustic output from the speaker 23 to the location(s) desired in and/or out of the wireless device 10. In addition, the channel 15 may extend to the front or forward surface of the device 10 without extending through the printed circuit board 30, such as by extending over or around an edge or surface thereof (not shown). The shape of the inner passage or gap space of the channel 15 can be selected to provide suitable sound quality and/or shape of the antenna element 20.

* * *

[0031] FIG. 3F illustrates that the antenna 20 can be positioned about the vertical segment 15v of the channel 15 and may continuously extend about a major portion of the perimeter of the cavity 15g. FIG. 3G illustrates that the antenna 20 may be positioned about a lower portion of the channel proximate the speaker 23 input (port). The channel 15 can be an elongate tubular channel with a length of about 20-50 mm and a width that is less than about 10 mm, and typically

between about 2-5 mm. As shown, the tubular channel 15 can have a wall (which may be a plurality of cojoined walls or a single wall) that defines the interior air gap space 15g. The channel 15 may be configured as a unitary member or as a plurality of joined segments. In certain embodiments, the conductive element 20e can be disposed and/or formed on the wall such that the two conductive opposing end portions of the element 20e.sub.1, 20e.sub.2 are spaced apart a distance so as to not contact.

* * *

[0038] As shown in FIG. 3A, the antenna element 20e extends and conforms to the shape of a portion of the wall and wraps about one of the side portions in a curvilinear (shown as arcuate or concave configuration) and extends across a portion of the wall on the opposing side of the gap 15g defined by the channel 15. In this embodiment, the antenna and supporting substrate portion only occupies a subset of the overall channel (does not cover the entire cavity wall). Other tubular or enclosed channel configurations and/or antenna element 20e configurations can be used. The tubular channel 15 shape can be used to provide acoustic sound quality for the speaker 23 and may be cylindrical, conical, frustoconical, or other desired shape.

Ying, ¶¶ 27-28, 31 and 38. Applicant submits that there is no disclosure or suggestion of a flat panel speaker in this text.

In contrast, various embodiments of the present invention are particularly directed to advantageous utilization of a flat-panel speaker in devices, such as cellular telephones. In particular, Claim 1 is directed to a wireless terminal where a flat-panel speaker is combined with an internal antenna. It is well known to those of skill in the art that a flat-panel speaker is a particular type of speaker and that not all speakers are flat-panel speakers. Accordingly, the anticipation rejections of independent Claim 1 and the claims that depend therefrom should be withdrawn for at least these reasons.

Independent Claim 9 is Patentable Over Ying:

In rejecting Claim 9, the Office Action asserts, among other things, that the transceiver 161s of Ying discloses "a balanced feed." Office Action, p. 5. The Office Action further acknowledges that Ying "is silent" on "an audio driver circuit." Office Action, p. 5. As an initial matter, the transceiver 161s simply is not a balanced feed coupling the speaker 23 of Ying to anything, nonetheless an audio circuit. In fact, the transceiver 161s is only

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described as being connected to respective antenna elements through signal feeds 28, 128 and that the antennas also have ground feeds 25, 125. Ying, ¶¶ 36, 47 and 53. Thus, there is no discussion of the transceiver being connected to a speaker and there is an indication that a balanced feed is not even used for the antenna connection. Accordingly, the rejections of independent Claim 9 should be withdrawn for at least these reasons.

Independent Claims 15, 27 and 29 are Patentable Over Ying:

Independent Claims 15 and 29 have been amended to recite that the speaker is a flat-panel speaker. Independent Claim 27, as previously amended, already recited that the speaker was a flat-panel speaker. Accordingly, independent Claims 15, 27 and 29 are patentable at least for the reasons discussed with reference to Claim 1 above.

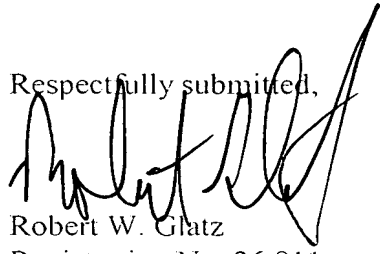
Various of the Dependent Claims are Separately Patentable:

The dependent claims are patentable at least based on the patentability of the claims from which they depend as discussed above. In addition, various of the dependent claims are also separately patentable. Various grounds for separate patentability were previously presented in the Applicant's amendment filed January 27, 2005, which is incorporated herein to the extent applicable. For example, various separate patentability arguments related to a flat-panel speaker are likewise applicable to the rejections based on Ying.

CONCLUSION

Applicant respectfully submits that, for at least the reasons discussed above, the references cited in the present rejections do not disclose or suggest the present invention as claimed. Accordingly, Applicant respectfully requests allowance of all the pending claims and passing this application to issue.

Respectfully submitted,



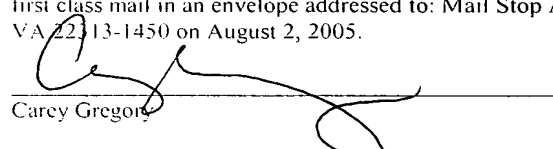
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